



EXCEL CELL ELECTRONIC CO., LTD.

NO.

A31100

SPECIFICATION

Edition

7

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ETR GQ RELAY

1. MAIN FEATURE :

- 1-1. Miniature size with low power consumption for rated loading to 16A.
- 1-2. Surge Strength up to 10,000V.
- 1-3. Operating temperature up to 105°C.
- 1-4. Halogen Free series available.
- 1-5. UL Class F insulation available.
- 1-6. Comply with RoHS and REACH regulations.
- 1-7. Safety standard & File unmbner:UL&C-UL E141060/TUV R50121172/VDE 40025456
- 1-8. Safety standard & IEC 60079-15 Ex nC – Sealed devices (Special Type)

2. SPECIFICATION:

2-1.ContactSpecification:

- 2-1-1. Contact Resistance: Maximum 100mΩ at initial value.
Test Current: 1A, Open Circuit Test Voltage: 6VDC.
By using Voltage Drop Method.
- 2-1-2. Contact Capacity: LM1: DM2F:
10Amps at 250VAC Cosφ=1. 16Amps at 277VAC Cosφ=0.75.
12Amps at 125VAC Cosφ=1. 16 Amps at 24VDC L/R=0.
10 Amps at 30VDC L/R=0. TV-8, 120VAC.
TV-5, 120VAC.
- 2-1-3. Operate Time 10 mSec. Max.
- 2-1-4. Release Time 5 mSec. Max.

2-2.Coil Specification at 20°C:

Coil Sensitivity	Nominal Voltage (VDC)	Nominal Current (mA)	Coil Resistance (Ω±10%)	Power Consumption (W)	Pull-In Voltage (VDC)	Holding Voltage (VDC)	Drop-Out Voltage (VDC)	Maximum Allowable Voltage (VDC)
GQ (LM1)	3	67	45	Abt. 0.20	80% Maximum	55% Minimum	5% Minimum	110%
	5	40	125					
	6	33.3	180					
	9	22.5	400					
	12	16.7	720					
	15	13.3	0					
	18	11.1	1,620					
	24	8.3	0					
	48	4.2	0					



Coil Sensitivity	Nominal Voltage (VDC)	Nominal Current (mA)	Coil Resistance ($\Omega \pm 10\%$)	Power Consumption (W)	Pull-In Voltage (VDC)	Holding Voltage (VDC)	Drop-Out Voltage (VDC)	Maximum Allowable Voltage (VDC)
GQ (DM2F)	5	71.4	70	Abt. 0.36	80% Maximum	55% Minimum	5% Minimum	110%
	6	60	100					
	9	40	225					
	12	30	400					
	15	24	625					
	18	20	900					
	24	15	1,600					
	36*	10	3,600					
	48	7.5	6,400					
	60	6	10,000					

* means 36V is UL only.

3. Electrical Characteristics:

3-1. Life Expectancy:

3-1-1. Electrical Life:

LM1:

100,000 operations Minimum at 10A/250VAC $\cos\phi=1$.

100,000 operations Minimum at 10A/30VDC L/R=0.

100,000 operations Minimum at 12A/125VAC $\cos\phi=1$.

25,000 operations Minimum at TV-5, 120VAC.

(Max. Ambient Temperature 40°C) Rated Voltage is applied.

DM2F:

90,000 operations Minimum at 16A/277VAC $\cos\phi=0.75$.

50,000 operations Minimum at 16A/24VDC L/R=0.

25,000 operations Minimum at TV-8, 120VAC.

(Max. Ambient Temperature 40°C) Rated Voltage is applied.

3-1-2. Mechanical Life:

10,000,000 operations Minimum at No Load condition.
Rated Voltage is applied.

3-1-3. Maximum Operating Frequency:

Electrical: 6 operations/minute.

Mechanical: 300 operations/minute.

3-2. Dielectric Strength:

3-2-1. Between Contacts:

1,000VAC at Test Frequency 50/60 Hz, Leakage Current:
5mA for 1 minute.

3-2-2. Between Coil & Contact:

4,000VAC at Test Frequency 50/60 Hz, Leakage Current:
5mA for 1 minute.

3-3. Insulation Resistance:

$\geq 100 \text{ M}\Omega$ Minimum.

A Voltage of 500VDC should be applied after which
measurement shall be made.

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3-4. Vibration

3-4-1. Endurance I:

The Coil shall be maintained under not energized condition, double amplitude 1.5 mm, the entire frequency range changes from 10 to 55 Hz then returns to 10 Hz shall be made in 1 minute. This motion shall be applied for a period of 2 hours in each of 3 mutually perpendicular axis (a total of 6 hours) There should not be any deformations in construction and in appearance, while the Electrical Specifications should be fulfilled after the test.

3-4-2. Endurance II (Error Operation):

The Coil shall be maintained under energized condition, double amplitude 1.5 mm, the entire frequency range changes from 10 to 55 Hz then returns to 10 Hz shall be made in 1 minute. This motion shall be applied for a period of 5 minutes in 3 mutually perpendicular axis. Malfunction is not allowed during the test (contact breaking time should be less than 1 millisecond) In addition, there should not be any deformations in construction and in appearance while the Electrical Specifications should be fulfilled after the test.

3-5. Shock:

3-5-1. Endurance I:

Peak Acceleration: 1000m/s²

The Coil shall be maintained under not energized condition, 5 successive shocks shall be applied in 3 mutually perpendicular axis. There should not be any deformations in construction and in appearance while the Electrical Specifications should be fulfilled after the test.

3-5-2. Endurance II (Error Operation):

Peak Acceleration: 100m/s²

The Coil should be maintained under energized condition, 2 successive shocks shall be applied in 3 mutually perpendicular axis. Malfunction is not allowed during the test (contact breaking time should be less than 1 millisecond) In addition, there should not be any deformations in construction and in appearance while the Electrical Specifications should be fulfilled after the test.

4. Environmental Characteristics:

4-1. Temperature Range:

4-1-1. Operating Temperature Range:

-40~+105°C

Operating temperature range is the range of ambient temperature of which the Relay can be operated continuously within operative voltage range of coil (no condensation of water drops under low temperature condition)

4-1-2. Storage Temperature Range:

-40~+105°C

Storage temperature range is the range of ambient temperature of which the Relay can be stored without damages (no condensation of water drops under low temperature condition). Conditions are as specified elsewhere in these specifications.

4-2. Humidity Range:

45~85% RH.

4-3. Coil Temperature Rise

40°C Max.

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4-4. Cold Resistance:

4-4-1. Cold Resistance in Use:

Relay should be kept in temperature chamber at $-40 \pm 2^{\circ}\text{C}$ for two hours that no current or voltage shall be supplied to Relay. Such condition shall be maintained while the rated voltage is supplied to Relay, then the Relay shall operate normally. (No condensation of water drops under low temperature condition)

4-4-2. Storage Cold Resistance:

Relay should be kept in temperature chamber at $-40 \pm 2^{\circ}\text{C}$ for 72 hours. Then the Relays shall be maintained at standard atmospheric condition for 1 to 2 hours after which measurement shall be made. Construction, Relay operation, Insulation Resistance and Dielectric Strength shall satisfy the specification requirements. (No condensation of water drops under low temperature condition)

4-5. Heat Resistance:

4-5-1. Heat Resistance in Use:

Relay should be kept in temperature chamber at $105 \pm 2^{\circ}\text{C}$ for two hours that rated Voltage should be supplied to Coil while rated Current should be supplied to Contacts. Such condition shall be maintained while the rated voltage is supplied to Relay, then Relay shall operate normally.

4-5-2. Storage Heat Resistance

Relay should be kept in temperature chamber at $105 \pm 2^{\circ}\text{C}$ Class for 16 hours. Then the Relays shall be maintained at standard atmospheric condition for 1 to 2 hours after which measurement shall be made. Construction, Relay operation, Insulation Resistance and Dielectric Strength shall satisfy the specification requirements.

4-6. Moisture Resistance:

Relay should be kept in temperature chamber at $40 \pm 2^{\circ}\text{C}$ (90~95% RH) for 48 hours. Then the Relays shall be maintained at standard atmospheric condition for 1 to 2 hours after which measurement shall be made. Construction, Relay operation, Insulation Resistance, Dielectric Strength shall satisfy the specification requirements.

5. Terminal Characteristics:

5-1. Soldering Dip Test:

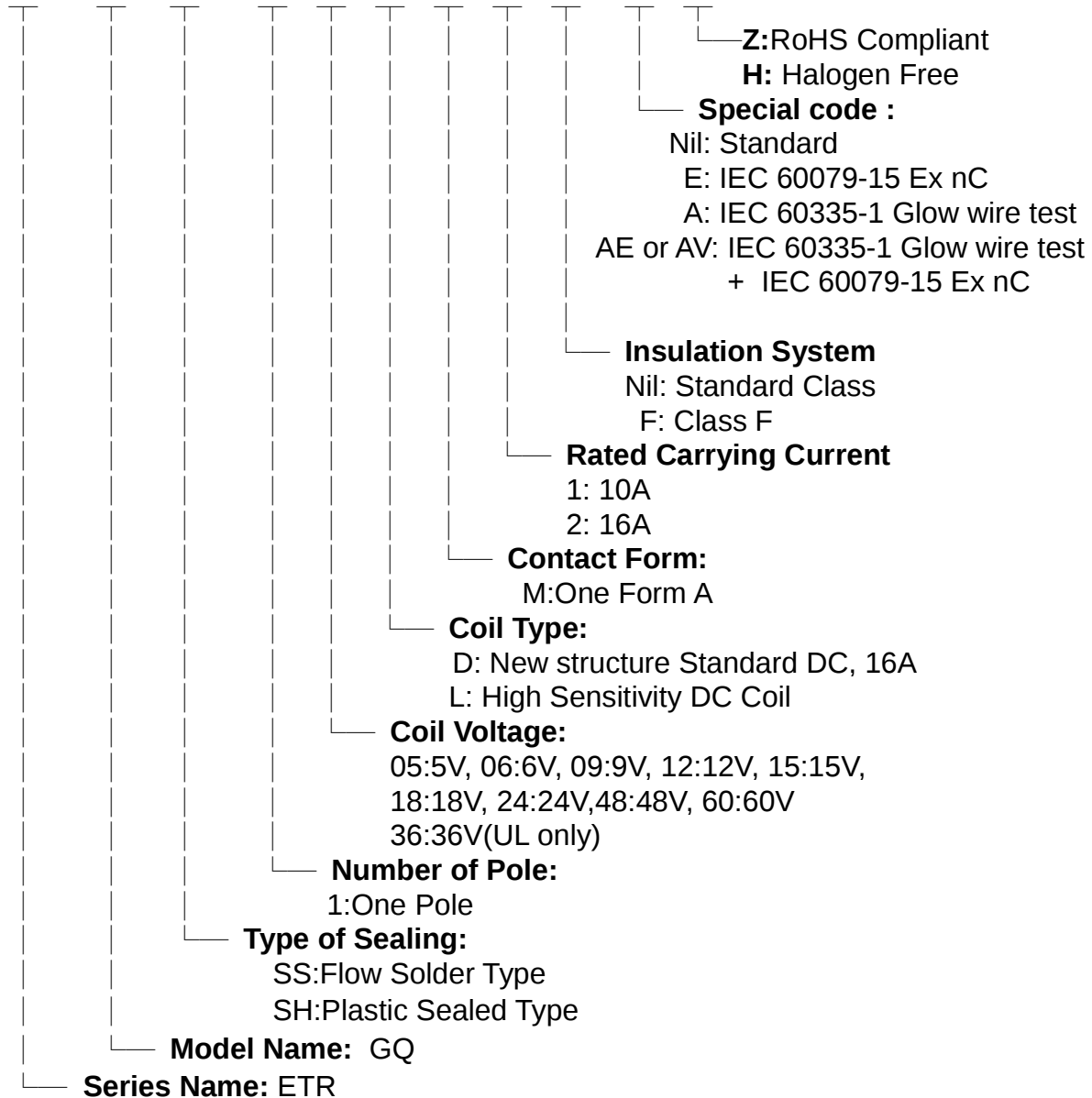
The front 3 mm of Terminal should be immersed for 3 ± 0.5 seconds at $260 \pm 5^{\circ}\text{C}$. Soldered area must be minimum 90% of the soldering surface.

5-2. Soldering Heat Resistance:

When the Terminal are immersed into soldering bath at 260°C for 5 seconds, the Relay shall satisfy all electrical and mechanical specifications and must not have excessive change in outside appearance.

**6. PART NUMBERING SYSTEM**

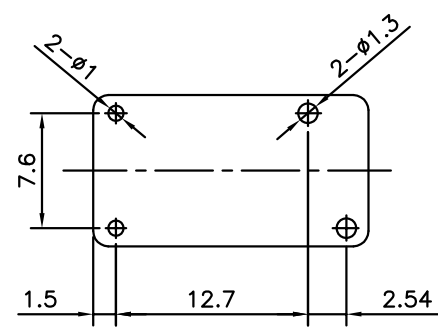
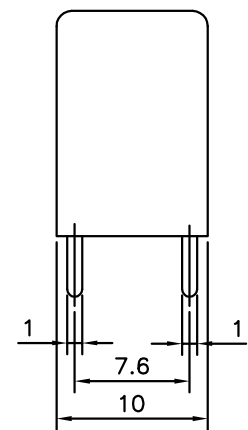
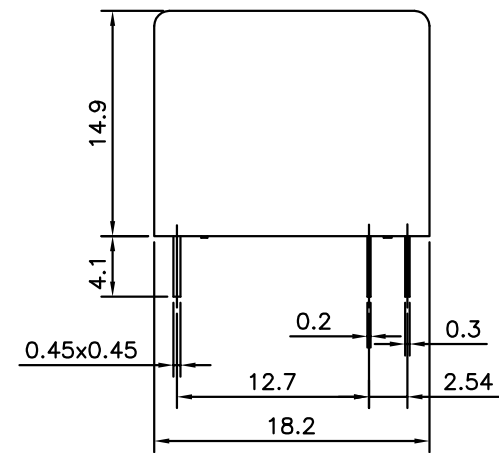
ETR - GQ - SS - 1 12 L M 1 F - E Z



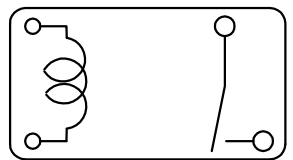
* Marking without: "ETR" & "Z" .

* 16A is DM2F TYPE

Dimension
LM1

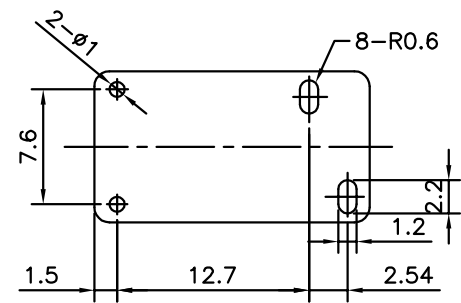
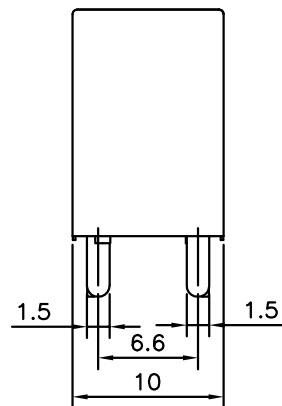
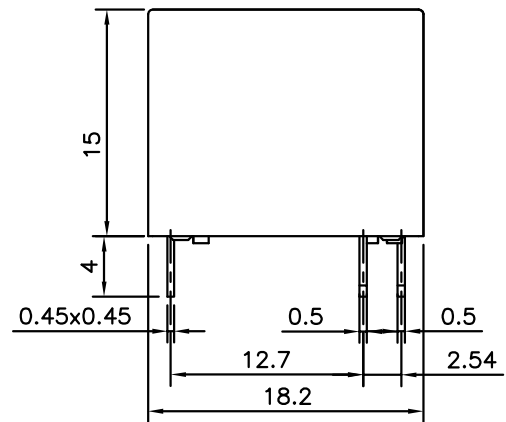


P.C.B LAYOUT

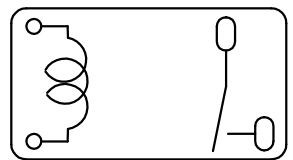


One Form A
BOTTOM VIEW

DM2F



P.C.B LAYOUT



One Form A
BOTTOM VIEW

				NORMAL TOLERANCE		PART NUMBER		-----			UNIT	MM(INCH)	PART NAME	ETR		
				RANGE	TOLERANCE	MATERIAL		-----			SCALE	2 : 1	TYPE	GQ-SS/SH		
				<=5	±0.2	CHECK		CCY	DESIGN	WINNIE	DRAWN	WINNIE	QUANTITY	-----	FILE NAME	GQ-SS/SH.DWG
C	ADD DM2F Dimension	winnie	2019/1/28	>5	±0.3								PROCESSING	-----	EDITION	C
B	Dimension edit 15.5->14.9 4.0->4.1	winnie	2016/5/16										PROJECTION		SURFACE TREATMENT	-----
NO.	DETAILS	ALTERED BY	DATE													

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